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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Sascha Kreiskott	Docket No.:	S-99,952
Serial No.:	10/624,350	Examiner:	Nicholas A. Smith
Filed :	7/21/2003	Art Unit:	1742

For : **HIGH CURRENT DENSITY ELECTROPOLISHING IN THE PREPARATION OF HIGHLY SMOOTH SUBSTRATE TAPES FOR COATED CONDUCTORS**

Customer No. 35068

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR §1.132

Sir:

I, Paul N. Arendt, declare the following:

1) That I, Paul N. Arendt, am an inventor of the subject matter claimed in U.S. Patent Application Serial No. 10/624,350 ("Application");

2) That I understand that the subject matter of the claimed invention has been rejected under 35 USC § 103(a) as obvious over Arendt (US 2003/0036483 A1) in view of Rosswag (US 4,372,831) and rejected under 35 USC § 103(a) as obvious over Glowacki (*Texture developments in long lengths of NiFe tapes for superconducting coated conductors*, Journal of Materials Science, vol. 37, no 1, pp 157-168, Jan 2002) in view of Rosswag (US 4,372,831);

3) That, as to the first basis for rejection, the subject matter claimed in the Application is not described or rendered obvious by the combined teachings of Arendt '483 in view of Rosswag because neither reference teaches a process for electropolishing a metallic tape to the claimed root mean square ("RMS") roughness of about 4 nanometers ("nm"), as in claim 1, or about 0.5 nm, as in claim 3;

4) That Arendt '483 teaches an article comprising a substrate, a layer of an inert oxide material upon the surface of the substrate, a layer of an amorphous oxide or oxynitride material upon the inert oxide material layer, and a layer of an oriented cubic oxide material having a rock-salt-like structure upon the amorphous oxide or oxynitride material layer;

5) That Arendt '483 paragraphs [0015] and [0016] teach that a metallic substrate often has a RMS roughness of 15 nm to 100 nm or greater;

6) That Arendt '483 paragraphs [0015] and [0016] teach that a metallic substrate can be mechanically polished, electrochemically polished, or chemically polished to reduce the RMS roughness, but, even if polished, the inert oxide layer must be deposited to give the substrate a RMS roughness of less than about 2 nm;

7) That one of ordinary skill in the art would not be able to attain a RMS roughness of less than about 2 nm by any electropolishing process disclosed in Arendt '483 without the inert oxide layer;

8) That at the time of Arendt '483 a process for electropolishing a metallic substrate to a RMS roughness of less than 2 nm was not known;

9) That Rosswag does not satisfy the deficiencies of Arendt '483;

10) That, as to the second basis for rejection, the subject matter claimed in the Application is not described or rendered obvious by the combined teachings of Glowacki in view of Rosswag because neither reference teaches a process for electropolishing a metallic tape to the claimed RMS roughness of about 4 nm;

11) That "mirror gloss" is a subjective term and that a surface does not need to be smooth to the claimed RMS roughness of about 4 nm to be sufficiently specular to be a mirror finish;

12) That "mirror gloss" can be discerned from a surface with a RMS roughness as high as 20 nm;

13) That, contrary to the Examiner's statements, combining Glowacki's disclosure and Rosswag's statement that "a mirror gloss or shine is obtained in the upper current density range" would not suggest to one skilled in the art that the claimed RMS roughness in claim 1 of about 4 nm could be achieved;

14) That, furthermore, combining Glowacki's disclosure and Rosswag's statement that "a mirror gloss or shine is obtained in the upper current density range" would not suggest to one skilled in the art that the claimed RMS roughness in claim 3 of about 0.5 nm could be achieved;

15) That I am a coauthor of *Improvements of IBAD MgO Template Layers on Metallic Substrates for YBCO HTS Deposition* (IEEE Transactions on Applied Superconductivity, vol. 13, no. 2; June 2003; submitted herewith) ("Article");

16) That the Article discusses the relationship of critical current density and substrate RMS roughness;

17) That, as shown in Figure 3, a dramatic increase in critical current density is observed with decreased substrate roughness;

18) That, in particular, Figure 3 shows that a critical current density of less than 0.2 megaamperes per square centimeter ("MA/cm^2") corresponds to a substrate RMS roughness of about 4 nm whereas a critical current density greater than 1.0 MA/cm^2 corresponds to a substrate RMS roughness of about 0.5 nm which indicates that a smoother substrate yields a significantly higher critical current density;

19) That, even though the Article involves a substrate with a coating layer, the same relationship between critical current density and substrate RMS roughness is observed for a 4 nm electropolished metallic tape and a 0.5 nm electropolished metallic tape;

20) That all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and

21) That these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon;

Paul N. Arendt — MAY 2, 2007

Paul N. Arendt — Date